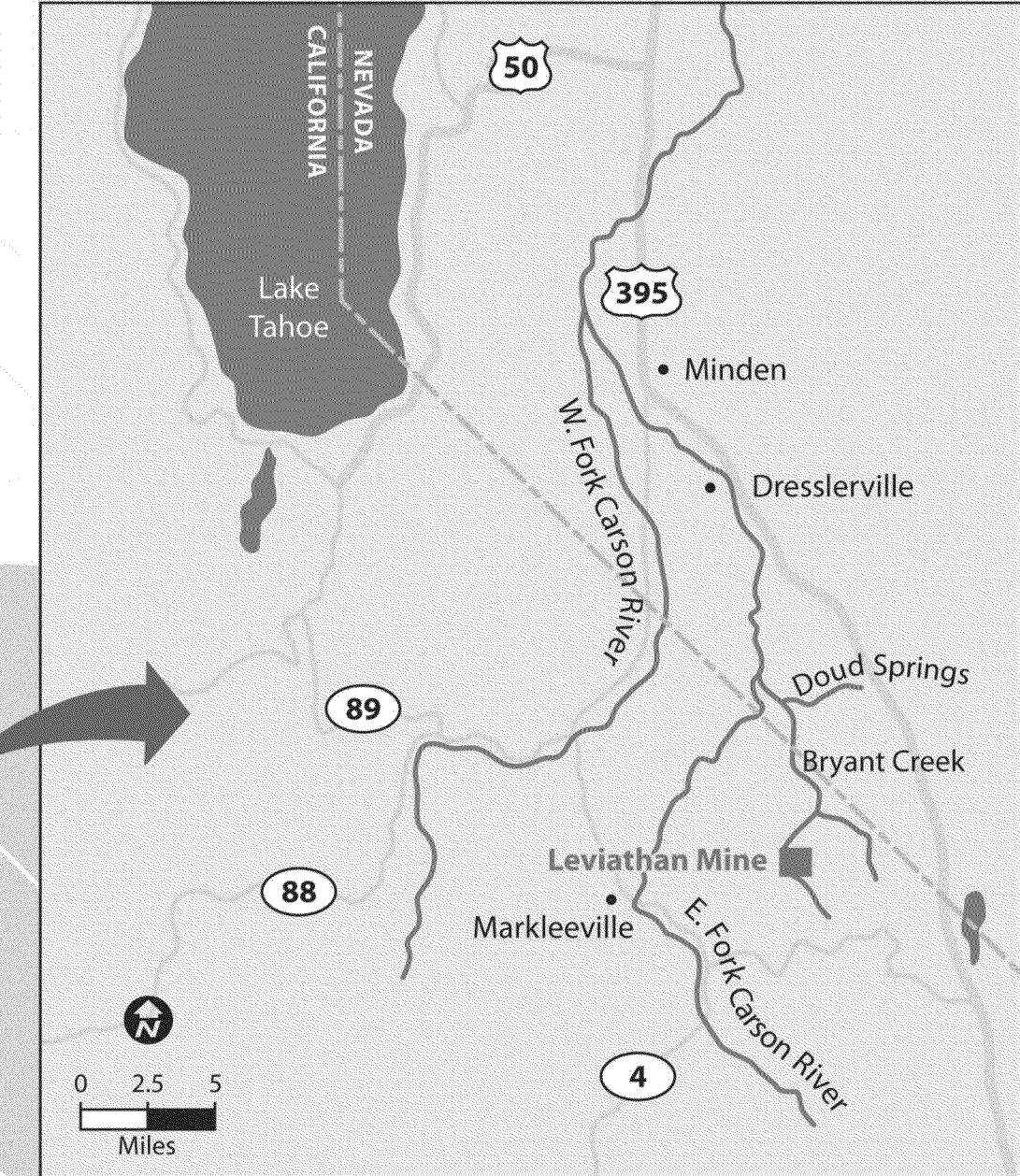


Leviathan Mine Superfund Site

**U.S.
Environmental
Protection Agency
Region 9**

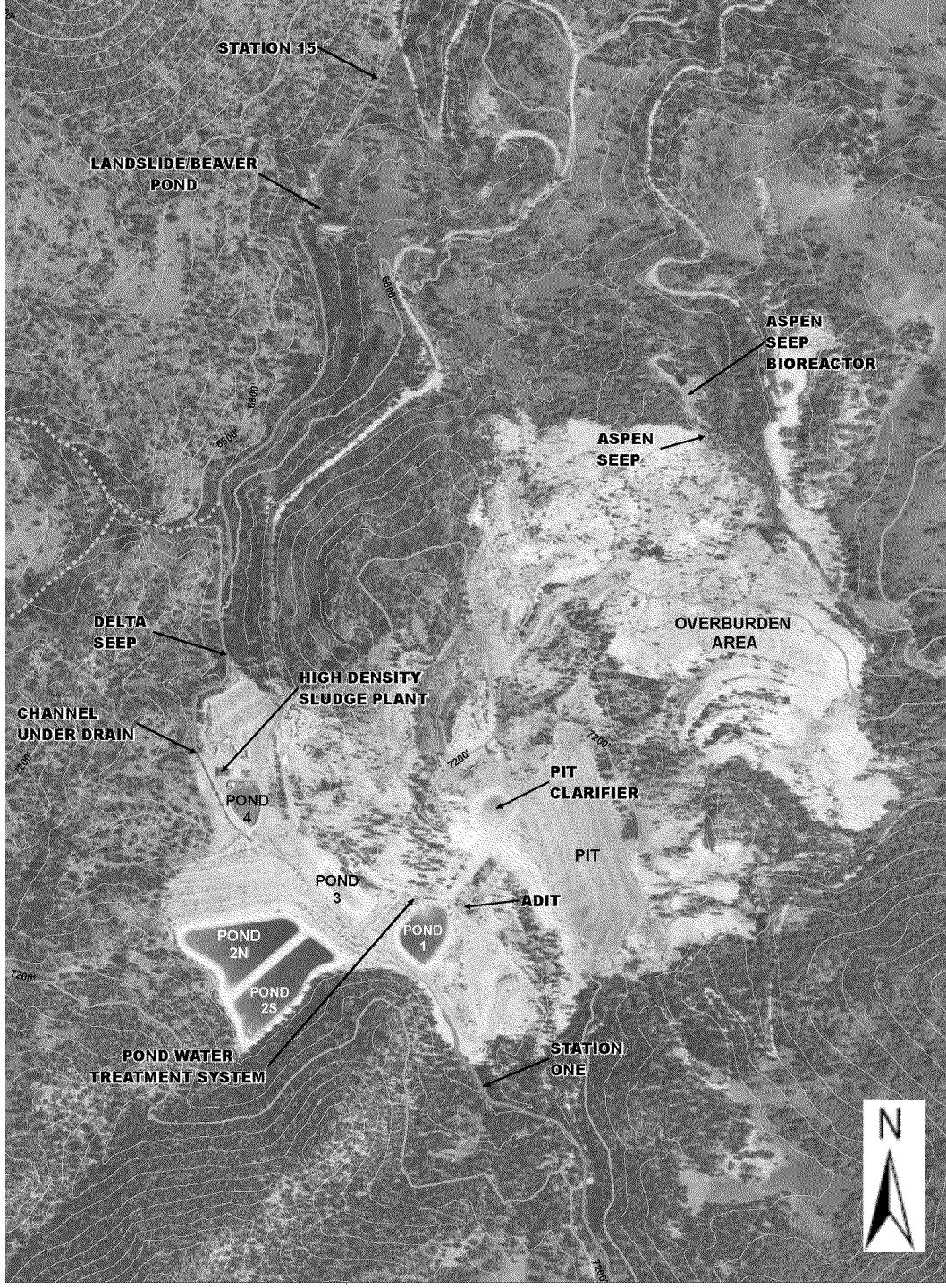
March 2017



Leviathan Mine Alpine County, CA

- Abandoned open-pit sulfur mine. Listed on NPL 2000
- 24 Miles Southeast of Lake Tahoe
- Flows Northeast, to EFCR
- Impacts ~250 acres On site, ~750 acres Off site
- High elevation, inaccessible in winter
- Upstream from national forest, private, and Washoe land
- Interim Actions 80's; & Removal Actions still in place
- Remedial Investigation Ordered in 2008





- Since 2001, most AMD captured and treated before discharge to Leviathan Creek during summer
- This annual seasonal treatment significantly improved downstream water quality in Leviathan Creek

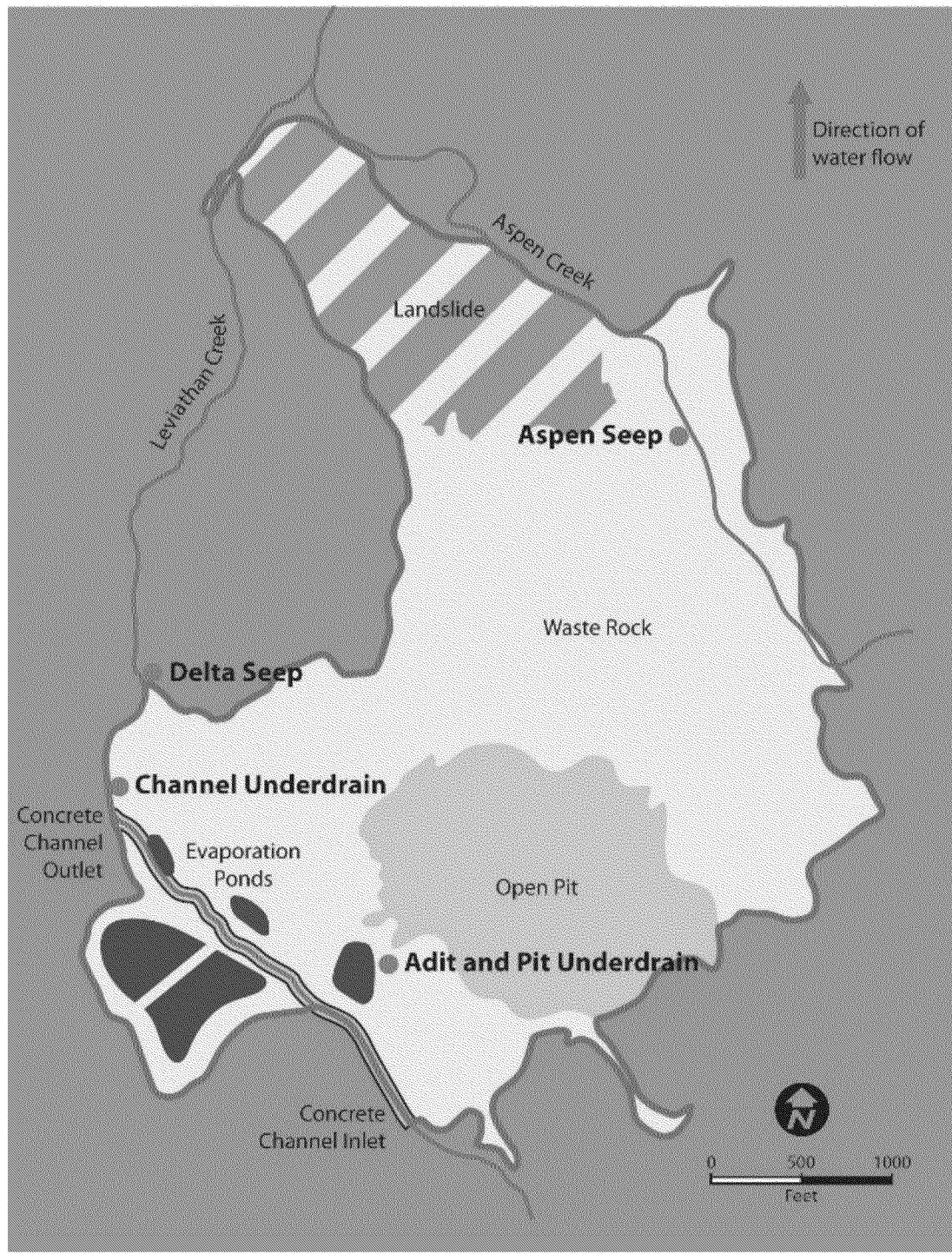
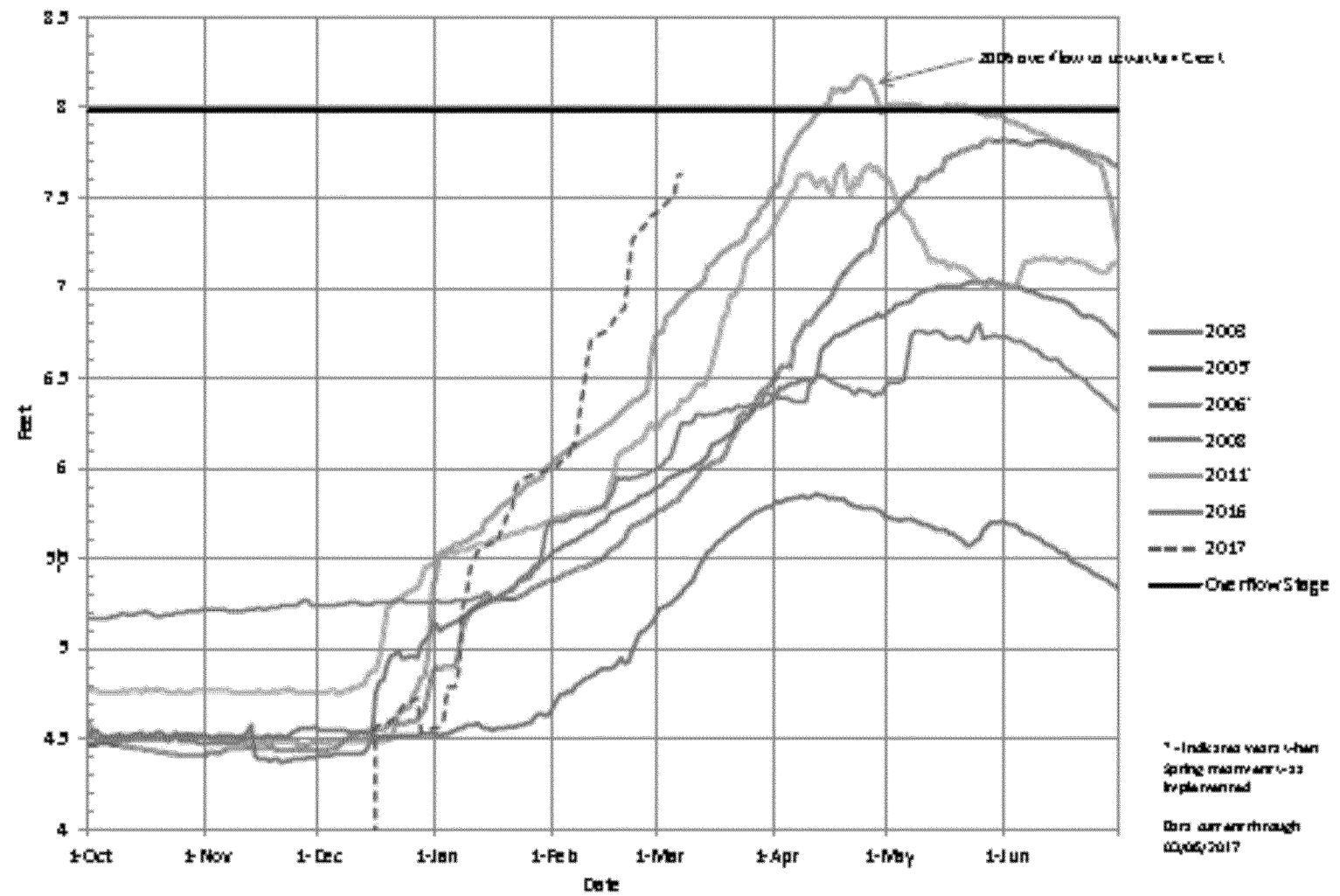


Figure 1 - Leviathan Mine Pond 1 Stage



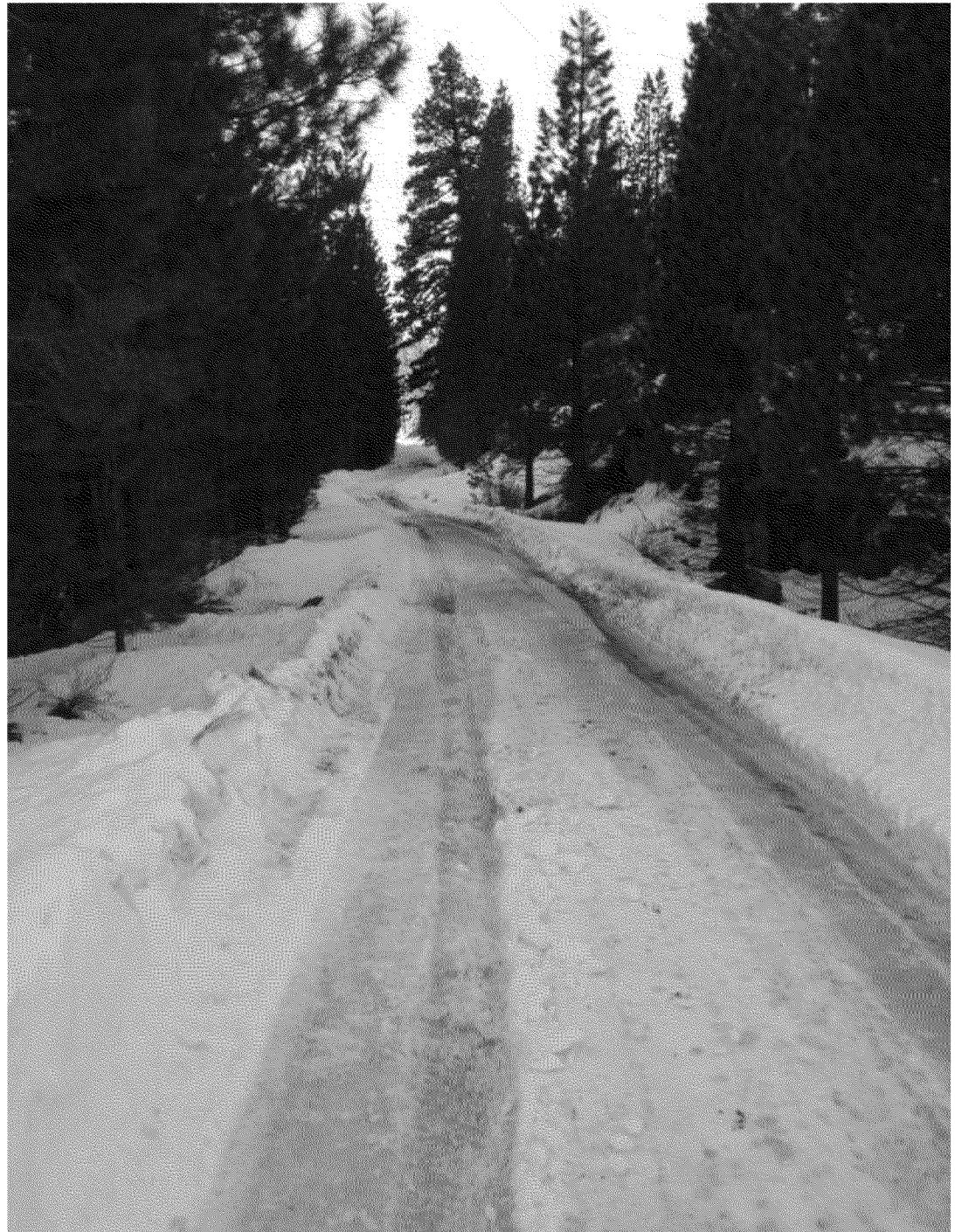


Photo 1 – Erosion on USFS Road 31032 due to storm water runoff



ED_001709_00002301-00006



Photo 3 – TNT neutralizing AMD in Pond 3 with the RCTS shortly before discharge

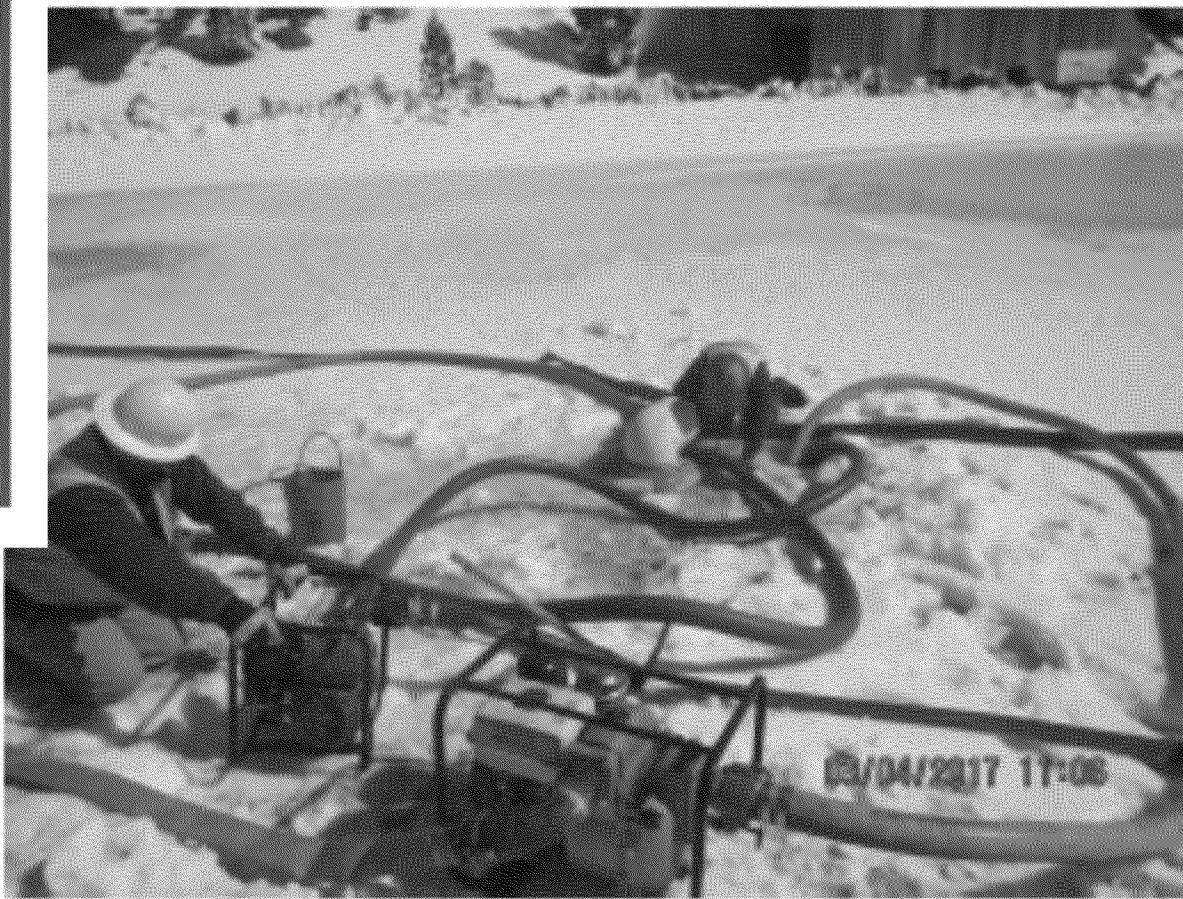


Photo 3 – Discharge of treated water from Pond 3 to Leviathan Creek via the overflow structure. Treated water was pumped from below the ice layer.

Table 1
2017 Spring Treatment, Leviathan Mine
Pond 3 Estimated Discharge Volume

Date	Estimated Discharge Volume (gallons)
4/20/2017	223,888
4/20/2017	423,888

Total Spring
Treatment & Discharge
Volume: 336,888

Table 2
2017 Spring Treatment, Leviathan Mine
Unrevised Pond Water Sample Results

SAMPLEID	Sample Description	SAMPLE DATE	pH	TDS (mg/L)	Aluminum	Anionic	Cadmium	Calcium	Chromium	Cobalt	Copper	Iron	Lead	Magnesium	Manganese	Nickel	Selenium	Sulfate (BaSO ₄)	Total Dissolved Solids	Zinc			
USGPA-Daily Maximum Discharge Criteria		6.0-9.0	1	0.04	0.009	NP	0.97	NP	0.026	2	0.126	NP	NP	0.04	NP	NP	NP	NP	0.24				
USGPA-A-Day Average Discharge Criteria		NP	2	0.15	0.009	NP	0.31	NP	0.016	1	0.005	NP	NP	0.04	0.005	NP	NP	NP	0.24				
					Result: 00/00	Result: 00/00																	
001P001	Unrevised water in Pond 3	2/04/2017	4.27	1.74	25	1	HB, 0.001	0.004	56.3	HB, 0.005	0.145	1	0.006	0.20	HB, 0.001	21.1	0.059	0.029	0.002	262	0	5.0	0.10
001P002	Unrevised water in Pond 1	2/04/2017	3.65	0.69	362	0	0.169	0.004	50.4	0.075	0.22	0	0.127	0.023	HB, 0.001	7.6	1.24	0.577	0.001	567	0	7.0	0.13
002P0004*	Unrevised water in Pond 2 South	2/7/2017																					
002P0005*	Unrevised water in Pond 2 South	2/11/2017																					

Table 3
2017 Spring Treatment, Leviathan Mine
Pond 3 Discharge Sample Results

SAMPLEID	Sample Description	SAMPLE DATE	pH	TDS (mg/L)	Aluminum	Anionic	Cadmium	Calcium	Chromium	Cobalt	Copper	Iron	Lead	Magnesium	Manganese	Nickel	Selenium	Sulfate (BaSO ₄)	Total Dissolved Solids	Zinc			
USGPA-Daily Maximum Discharge Criteria		6.0-9.0	1	0.04	0.009	NP	0.97	NP	0.026	2	0.126	NP	NP	0.04	NP	NP	NP	NP	0.24				
USGPA-A-Day Average Discharge Criteria		NP	2	0.15	0.009	NP	0.31	NP	0.016	1	0.005	NP	NP	0.04	0.005	NP	NP	NP	0.24				
					Result: 00/00	Result: 00/00																	
002D0002	Pond 3, Treated discharge	2/4/2017	2.64	0.00	316	0	HB, 0.001	0.002	56.3	HB, 0.005	0.059	0	0.047	0.11	0.002	19.5	0.471	0.161	-	262	0	2.0	0.05
004D0005	Pond 3, Treated discharge	2/10/2017																					

All values reported in mg/L per liter (mg/l) except pH which are in Standard Units and nonparametric which are in the units specified above.

All parametric results are dissolved except Selenium which is total as dissolved.

All nonparametric results are dissolved.

NP - Not Provided

HB - Not Determined

- - Analytical results pending

Sample result exceeds USGPA Daily Maximum Discharge Criteria

Data Qualifiers (DQ) from the laboratory:

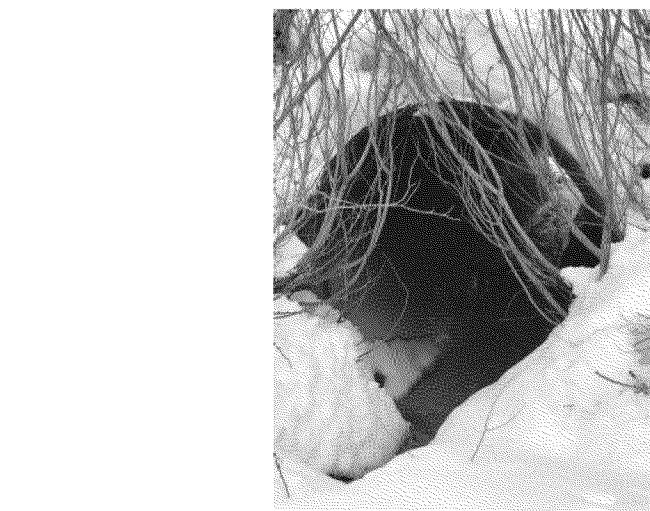
D - Analytical reporting limit increased due to analytical method

L - Lower detectable reporting limit for the analytical method used

HB - Not determined in the reporting limit, may be below the detection limit or represents the reporting limit

Contingency and Monitoring Plan

During each event, field observations indicated that adequate pond storage was available, and there was no indication of beaver dam failure or restriction of the Leviathan Creek Culvert.



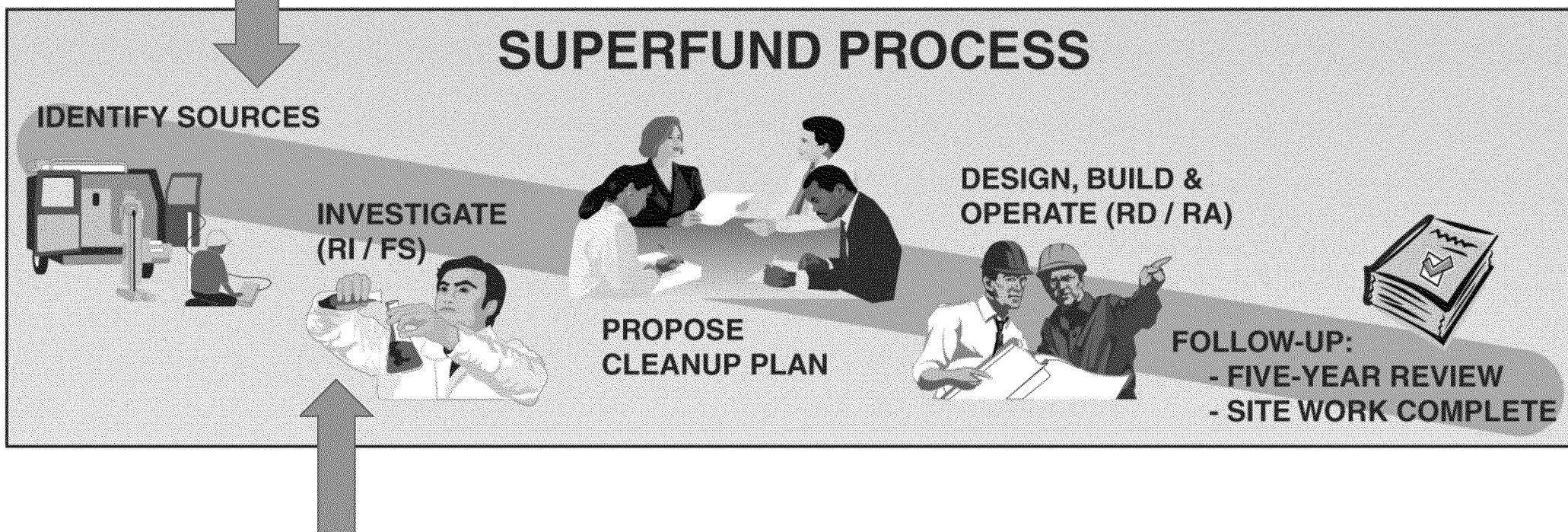
Photograph 6: Leviathan Creek Culvert Looking Downstream

ARC visits	RWQCB Visits
December 2, 2016	January 17, 2017
January 6, 2017	February 14 , 2017
February 1, 2017	February 26, 2017
March 2017, TBC	March or early April, 2017 TBC

ARC Oversight Early Response Actions

Aspen Seep Bioreactor	HDS Plant
<p>Increase in flow through the ASB Treatment System; higher flows are expected during most of 2017</p> <ul style="list-style-type: none">--More consumables (Ethanol, NaOH, and propane)--Remote monitoring adjust chemical dosing for changing flow rates--Access via snowmobiles--Increased flows do not appear to affecting operating effectiveness.--Continue to monitor for system effectiveness	<p>HDS does not operate during the winter months</p> <ul style="list-style-type: none">--Increased flow rates of CUD and DS--Higher than average initial volume of Pond 4--Increased use of consumables (lime, flocculant, diesel, fresh water).--Site access/ treatment season could be limited

Early Interim Actions



Remedial Investigation and Feasibility Study (RI/FS)

EPA Contact Information

EPA's Superfund Toll-Free telephone number 1-800-231-3075

Lynda Deschambault (415) 947-4183
deschambault.lynda@epa.gov

EPA's Web page: www.epa.gov/region09/LeviathanMineSite

Information Repositories

Douglas County Library
1625 Library Lane
Minden, NV 89432
(775) 782-9841

EPA Superfund Records Center
75 Hawthorne Street (3rd Floor)
San Francisco, CA 94105
(415) 536-2000